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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,225	08/06/2001	Stephen J. Plante	A0312/7410 WRM	8975

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EXAMINER
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TORRES, JOSEPH D

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 03/26/2004

4

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/923,225

Applicant(s)

PLANTE ET AL.

Examiner

Joseph D. Torres

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-24 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-6 and 18, drawn to A Method for Calculating and Selecting a State Metric at Time  $t_1$  by Specifying Transition Metrics from Time  $t_0$  to  $t_1$ , Adding a Transition Metric to a State Metric at Time  $t_0$ , Subtracting a Transition Metric from another State Metric at Time  $t_0$  and Selecting the Maximum of the Two State Metrics for Time  $t_0$ , classified in class 714, subclass 786.
- II. Claims 7-14 and 19, drawn to A Method for Calculating  $\alpha$  and  $\beta$  State Metrics at Time  $t_1$  for A Maximum Likelihood Algorithm using an  $\alpha$  Metric at Time  $t_0$  and a Transition Metric from Time  $t_0$  to  $t_1$  to Calculate the  $\alpha$  Metric at Time  $t_1$  and an  $\beta$  Metric at Time  $t_2$  and a Transition Metric from Time  $t_2$  to  $t_1$  to Calculate the  $\beta$  Metric at Time  $t_1$ , classified in class 714, subclass 794.
- III. Claims 15-17 and 20, drawn to A Method for Calculating a log Map Function using a Correction Factor, classified in class 714, subclass 794.
- IV. Claims 21-24, drawn to An Accelerator with First and Second Carry Save Adders, First and Second Full Adders and a Look-up Table, classified in class 714, subclass 459.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group II, A Method for Calculating  $\alpha$  and  $\beta$  State Metrics at Time  $t_1$  for A Maximum Likelihood Algorithm using an  $\alpha$  Metric at Time  $t_0$  and a Transition Metric from Time  $t_0$  to  $t_1$  to Calculate the  $\alpha$  Metric at Time  $t_1$  and an  $\beta$  Metric at Time  $t_2$  and a Transition Metric from Time  $t_2$  to  $t_1$  to Calculate the  $\beta$  Metric at Time  $t_1$ , and Group I, A Method for Calculating and Selecting a State Metric at Time  $t_1$  by Specifying Transition Metrics from Time  $t_0$  to  $t_1$ , Adding a Transition Metric to a State Metric at Time  $t_0$ , Subtracting a Transition Metric from another State Metric at Time  $t_0$  and Selecting the Maximum of the Two State Metrics for Time  $t_0$ , are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination, Group II, A Method for Calculating  $\alpha$  and  $\beta$  State Metrics at Time  $t_1$  for A Maximum Likelihood Algorithm using an  $\alpha$  Metric at Time  $t_0$  and a Transition Metric from Time  $t_0$  to  $t_1$  to Calculate the  $\alpha$  Metric at Time  $t_1$  and an  $\beta$  Metric at Time  $t_2$  and a Transition Metric from Time  $t_2$  to  $t_1$  to Calculate the  $\beta$  Metric at Time  $t_1$ , as claimed does not require the particulars of the subcombination, Group I, A Method for Calculating and Selecting a State Metric at Time  $t_1$  by Specifying Transition Metrics from Time  $t_0$  to  $t_1$ , Adding a Transition Metric to a State Metric at Time  $t_0$ , Subtracting a Transition Metric from another State Metric at Time  $t_0$  and Selecting the Maximum of the Two State Metrics for Time  $t_0$ , as claimed because the combination does not require steps for calculating and selecting a state metric at time  $t_1$  by specifying transition metrics from time  $t_0$  to  $t_1$ ,

adding a transition metric to a state metric at time  $t_0$ , subtracting a transition metric from another state metric at time  $t_0$  and selecting the maximum of the two state metrics for time  $t_0$ . The subcombination has separate utility such as in a Viterbi decoder.

Inventions Group I, A Method for Calculating and Selecting a State Metric at Time  $t_1$  by Specifying Transition Metrics from Time  $t_0$  to  $t_1$ , Adding a Transition Metric to a State Metric at Time  $t_0$ , Subtracting a Transition Metric from another State Metric at Time  $t_0$  and Selecting the Maximum of the Two State Metrics for Time  $t_0$ , and Group III, A Method for Calculating a log Map Function using a Correction Factor, are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention Group I, A Method for Calculating and Selecting a State Metric at Time  $t_1$  by Specifying Transition Metrics from Time  $t_0$  to  $t_1$ , Adding a Transition Metric to a State Metric at Time  $t_0$ , Subtracting a Transition Metric from another State Metric at Time  $t_0$  and Selecting the Maximum of the Two State Metrics for Time  $t_0$ , has separate utility such as in a Viterbi Decoder. See MPEP § 806.05(d).

Inventions Group I, A Method for Calculating and Selecting a State Metric at Time  $t_1$  by Specifying Transition Metrics from Time  $t_0$  to  $t_1$ , Adding a Transition Metric to a State Metric at Time  $t_0$ , Subtracting a Transition Metric from another State Metric at Time  $t_0$  and Selecting the Maximum of the Two State Metrics for Time  $t_0$ , and Group IV, An Accelerator with First and Second Carry Save Adders, First and Second Full Adders and a Look-up Table, are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown

to be separately usable. In the instant case, invention Group I, A Method for Calculating and Selecting a State Metric at Time  $t_1$  by Specifying Transition Metrics from Time  $t_0$  to  $t_1$ , Adding a Transition Metric to a State Metric at Time  $t_0$ , Subtracting a Transition Metric from another State Metric at Time  $t_0$  and Selecting the Maximum of the Two State Metrics for Time  $t_0$ , has separate utility such as in a Viterbi decoder. See MPEP § 806.05(d).

Inventions Group II, A Method for Calculating  $\alpha$  and  $\beta$  State Metrics at Time  $t_1$  for A Maximum Likelihood Algorithm using an  $\alpha$  Metric at Time  $t_0$  and a Transition Metric from Time  $t_0$  to  $t_1$  to Calculate the  $\alpha$  Metric at Time  $t_1$  and an  $\beta$  Metric at Time  $t_2$  and a Transition Metric from Time  $t_2$  to  $t_1$  to Calculate the  $\beta$  Metric at Time  $t_1$ , and Group III, A Method for Calculating a log Map Function using a Correction Factor, are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention Group II, A Method for Calculating  $\alpha$  and  $\beta$  State Metrics at Time  $t_1$  for A Maximum Likelihood Algorithm using an  $\alpha$  Metric at Time  $t_0$  and a Transition Metric from Time  $t_0$  to  $t_1$  to Calculate the  $\alpha$  Metric at Time  $t_1$  and an  $\beta$  Metric at Time  $t_2$  and a Transition Metric from Time  $t_2$  to  $t_1$  to Calculate the  $\beta$  Metric at Time  $t_1$ , has separate utility such as in a Maximum Likelihood Algorithm not using a correction factor to approximate the log MAP function, that is only using an initial approximation. See MPEP § 806.05(d).

Inventions Group II, A Method for Calculating  $\alpha$  and  $\beta$  State Metrics at Time  $t_1$  for A Maximum Likelihood Algorithm using an  $\alpha$  Metric at Time  $t_0$  and a Transition Metric

from Time  $t_0$  to  $t_1$  to Calculate the  $\alpha$  Metric at Time  $t_1$  and an  $\beta$  Metric at Time  $t_2$  and a Transition Metric from Time  $t_2$  to  $t_1$  to Calculate the  $\beta$  Metric at Time  $t_1$ , and Group IV, An Accelerator with First and Second Carry Save Adders, First and Second Full Adders and a Look-up Table, are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention Group II, A Method for Calculating  $\alpha$  and  $\beta$  State Metrics at Time  $t_1$  for A Maximum Likelihood Algorithm using an  $\alpha$  Metric at Time  $t_0$  and a Transition Metric from Time  $t_0$  to  $t_1$  to Calculate the  $\alpha$  Metric at Time  $t_1$  and an  $\beta$  Metric at Time  $t_2$  and a Transition Metric from Time  $t_2$  to  $t_1$  to Calculate the  $\beta$  Metric at Time  $t_1$ , has separate utility such as in a Maximum Likelihood Algorithm not using an accelerator with first and second carry save adders, first and second full adders and a look-up table. See MPEP § 806.05(d).

Inventions Group III, A Method for Calculating a log Map Function using a Correction Factor, and Group IV, An Accelerator with First and Second Carry Save Adders, First and Second Full Adders and a Look-up Table, are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case Group III requires a sum or difference and in a Galois Field sum and difference are not necessarily the same operation.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II and vice a versa, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group III and vice a versa, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group IV and vice a versa, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group III and vice a versa, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group IV and vice a versa, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group III is not required for Group IV and vice a versa, restriction for examination purposes as indicated is proper.



Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

A telephone call was made to William McClellan on 23 March 2004 to request an oral election to the above restriction requirement, but did not result in an election being made.

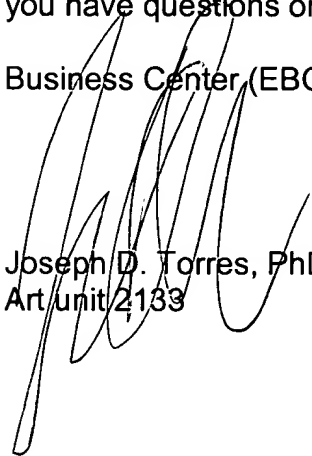
Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (703) 308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph D. Torres, PhD  
Art unit 2133